

REMARKS

Claims 1, 2, 4-10 and 14-18 are pending in this application. Reconsideration of the rejections in view of these amendments and the following remarks is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made."

Objection to New Matter in the Specification

The Amendment, previously filed January 16, 2002, was objected to because it allegedly introduced new matter into the disclosure.

The specification has been amended to overcome the objection.

Rejections under 35 USC §112

Claims 1, 2, 4-10 and 14-18 were rejected under 35 USC §112, first paragraph, as being indefinite because these claims fails to satisfy the written description requirement.

The claims have been amended to overcome the rejections. In the amendment, "a glass transition point less than or equal to 50 °C" has been amended to "a glass transition point less than or equal to 45 °C," and "-30 through 50 °C" has been amended to "-30 through 45 °C." The recitation "a glass transition point of 45 °C" has support in Table 1.

Also, "1 wt % or more of polymeric monomer" has been amended to "5 wt % or more of polymeric monomer." The recitation "5 wt % or more of polymeric monomer" also has support in Table 1.

Thus, the 35 USC §112, first paragraph rejection has been overcome.

Claims 1, 2, 4-10 and 14-18 were rejected under 35 USC §112, second paragraph, as being indefinite.

The claims have been amended to overcome the rejections. In the amendment, "a radical polymeric monomer" has been amended to "a radical polymeric monomer composition."

Although the Examiner alleged that "it is not clear if the copolymer is obtained from each of the recited styrene, alkyl (meth)acrylate, and monomer including a polar group, or only one of these monomers or only two of these monomers," it would be clear for a person skilled in the art, after the above amendment, that the copolymer is obtained from each of the recited styrene, alkyl (meth)acrylate, and monomer including a polar group.

As to the recitation "derivatives," recitations regarding "derivatives" have been deleted.

As to the term "a piezo-type inkjet head," the recitation has been amended to "an inkjet head using a piezoelectric element."

Thus, the 35 USC §112, second paragraph rejection has been overcome.

Rejections under 35 USC §103(a)

Claims 1, 2, 4, 6-10, 14 and 16-18 were rejected under 35 U.S.C. §103(a) as being obvious over Nguyen et al (U.S. Patent No. 6,248,805) in view of Patel et al (U.S. Patent No. 5,977,210); Claim 5 was rejected under 35 U.S.C. §103(a) as being obvious over Nguyen et al in view of Patel et al, and further in view of either *Polymer Science Dictionary* or Fujisawa et al (U.S. Patent No. 5,997,136); Claims 1, 2, 4, 8-10, 14 and 16-18 were rejected under 35 U.S.C. §103(a) as being obvious over Patel et al in view of Satake et al (U.S. Patent No. 5,814,685); Claim 5 was rejected under 35 U.S.C. §103(a) as being obvious over Patel et al, and further in view of Fujisawa et al; and Claim 15 was rejected under 35 U.S.C. §103(a) as being obvious over Patel et al in view of Satake et al, and further in view of Nkansah et al (U.S. Patent No. 5,962,580).

Amended independent claims 1, 14, 16 and 17 recite "a glass transition point less than or equal to 45 °C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.01 through 2 μm obtained from a radical polymeric monomer composition consisting essentially of: (a) 20 through 99 wt% of styrene; (b) 10 through 80 wt% of alkyl acrylate or alkyl methacrylate; and (c) 5 wt % or more of polymeric monomer including a polar group."

The above recitations are supported in the specification at page 7, line 3 - page 8, line 8, and page 11, line 19 - page 12, line 2. The recitations are important to achieve "rapid drying" and "stable fixation." After the solvent penetrates through the recording medium, the copolymer particles fully change into a film shape and form the image of high fixation. Therefore, the image does not get disfigured when the image

is rubbed with a finger ("stable fixation"). The glass transition point and a softening point measured by a flow tester of the copolymer must be adjusted in the suitable range to realize both "rapid drying" and "stable fixation". This adjustment requires specific monomer composition as recited in claims 1, 14, 16 and 17.

The cited references, taken separate or in combination, do not teach or suggest the recitations or the advantage of the recited features.

For at least these reasons, claims 1, 14, 16 and 17 patentably distinguish over the cited references. Claim 2, 4 and 6-10, depending from claim 1, patentably distinguish over the references for at least the same reasons. The same thing can be said about claim 15 depending from claim 14, and claim 18 depending from claim 17.

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

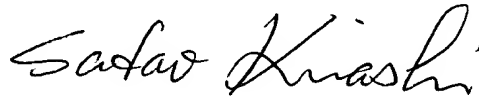
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Serial No. 09/492,373

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



Sadao Kinashi
Attorney for Applicants
Reg. No. 48,075

SK/fs

Atty. Docket No. **991444**
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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PATENT TRADEMARK OFFICE

Enclosures: Version with Markings to Show Changes Made

IN THE SPECIFICATION:

The paragraph beginning at page 7, line 23, has been amended as follows:

A glass transition point of the copolymer is preferably at or below ~~50°C~~ 70°C and further preferably ranges from -30 through ~~50°C~~ 70°C. A softening point of the copolymer according to a flow tester is preferably at or below room temperature and further preferably ranges from 40 through 150°C. The reason why the above glass transition point and softening point are preferable is that the primary particle of a polymer after the ink reached on the recording medium forms a thin film shape and a recording layer of high color saturation (i.e., high quality image). If the glass transition point and softening point were higher than the above range, a sufficient film could not be formed whereby the color saturation might become lower (poorly reproducing its original image color) or an ink film might exfoliate (making the image harder to be fixed). If the glass transition point and softening point were lower than the above range, a film of insufficient strength could, for example, undesirably result in producing a blur of the image when rubbed with a finger (making the image harder to be fixed).

IN THE CLAIMS:

Claims 1, 4, 14, 16, 17 and 18 have been amended as follows:

1. (Three Times Amended) Ink comprising:

a primary particle of a copolymer that has a glass transition point less than or equal to 50°C 45°C ,
a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle
diameter ranging from 0.01 through $2\text{ }\mu\text{m}$ obtained from a radical polymeric monomer composition
consisting essentially of:

(a) 20 through $99\text{ wt}\%$ of styrene ~~and styrene derivative~~;

(b) 10 through $80\text{ wt}\%$ of alkyl acrylate~~[,]~~ or alkyl methacrylate ~~and derivatives of alkyl~~
~~acrylate and alkyl methacrylate~~; and

(c) ~~$1\text{ wt}\%$~~ $5\text{ wt}\%$ or more of polymeric monomer including a polar group;

a colorant; and

a solvent that is liquid at room temperature.

4. (Twice Amended) The ink according to claim 1, wherein said copolymer has a glass transition
point ranging from -30 through 50°C 45°C .

14. (Three Times Amended) Ink comprising:

a copolymer particle that has a glass transition point less than or equal to 50°C 45°C , a softening
point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter
ranging from 0.01 through $2\text{ }\mu\text{m}$ obtained from a radical polymeric monomer composition consisting
essentially of:

(a) 20 through 99 wt% of styrene ~~and styrene derivative~~;

(b) 10 through 80 wt% of alkyl acrylate~~[,] or alkyl methacrylate and derivatives of alkyl acrylate and alkyl methacrylate~~; and

(c) ~~1 wt %~~ 5 wt % or more of polymeric monomer including a polar group;

a colorant; and

a solvent that is liquid at room temperature.

16. (Three Times Amended) An ink cartridge including a case and ink which is stored n said case and comprises:

a copolymer particle that has a glass transition point less than or equal to ~~50°C~~ 45 °C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.01 through 2 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of styrene ~~and styrene derivative~~; and

(b) 10 through 80 wt% of alkyl acrylate~~[,] or alkyl methacrylate and derivatives of alkyl acrylate and alkyl methacrylate~~; and

(c) ~~1 wt %~~ 5 wt % or more of polymeric monomer including a polar group;

a colorant; and

a solvent that is liquid at room temperature.

1 17. (Three Times Amended) A recording device including a head and an ink cartridge supplying
2 ink to said head, wherein said ink comprises:

3 a copolymer particle that has a glass transition point less than or equal to ~~50°C~~ 45 °C, a softening
4 point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter
5 ranging from 0.01 through 2 μm obtained from a radical polymeric monomer composition consisting
6 essentially of:

7 (a) 20 through 99 wt% of styrene ~~and styrene derivative~~; and

8 (b) 10 through 80 wt% of alkyl acrylate~~[,]~~ or alkyl methacrylate ~~and derivatives of alkyl~~
9 ~~acrylate and alkyl methacrylate~~; and

10 (c) ~~1 wt %~~ 5 wt % or more of polymeric monomer including a polar group;

11 a colorant; and

12 a solvent that is liquid at room temperature.

18. (Amended) A recording device according to claim 17, wherein said head is a ~~piezo-type~~ an
inkjet head using a piezoelectric element.